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Supplementary Information

Presentation from Nuclear Waste Watch and Inter-Church Uranium Committee Educational Cooperative

In the Matter of

Saskatchewan Research Council, SLOWPOKE-2 Reactor

Request by the Saskatchewan Research Council to authorize the decommissioning of the SLOWPOKE-2 reactor

Commission Public Hearing

September 26, 2019

Renseignements supplémentaires

Présentation d'Action Déchets Nucléaires et Inter-Church Uranium Committee Educational Cooperative

À l'égard de

Saskatchewan Research Council Installation nucléaire SLOWPOKE-2

Demande du Saskatchewan Research Council afin d'autoriser le déclassement du réacteur SLOWPOKE-2

Audience publique de la Commission

Le 26 septembre 2019

Canada

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Decommissioning of Saskatchewan Research Council SLOWPOKE-2 Reactor

Submission to the CNSC from
Nuclear Waste Watch (NWW) and
Inter-Church Uranium Committee
Educational Cooperative's

Hearing Ref. 2019-H-100
September 26, 2019

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EQUITY. JUSTICE. HEALTH.

NUCLEAR WASTE WATCH ACTION DÉCHETS NUCLÉAIRES

I. Introduction

Nuclear Waste Watch (NWW)

- NWW is a network of organizations concerned about radioactive waste in Canada
- NWW provides a public-interest response to nuclear waste proposals and policies

NUCLEAR WASTE WATCH ACTION DÉCHETS NUCLÉAIRES

https://nuclearwastewatch.weebly.com

I. Introduction (cont.)

Inter-Church Uranium Committee Educational Cooperative (ICUCEC)

- ICUCEC is an inter-church coalition that works to educate people about the nuclear industry and halt all nuclear development in Saskatchewan

http://icucec.org

I. Introduction (cont.)

Canadian Environmental Law Association (CELA)

- CELA is a non-profit, public interest organization funded by Legal Aid Ontario
- CELA uses existing laws to protect the environment and to advocate for environmental law reform

www.cela.ca

II. Scope of Review

- NWW and ICUCEC received participant funding from the CNSC to review SRC's licence amendment application to authorize decommissioning of its SLOWPOKE-2 reactor

- NWW and ICUCEC reviewed:
  - The sufficiency of Canada's regulatory framework for decommissioning
  - Past incidents involving SLOWPOKE-2 reactors in Canada
  - The adequacy of CNSC staff's CMD and SRC's licence application
- Summary of Recommendations provided on Slides 24-31

NUCLEAR WASTE WATCH ACTION DÉCHETS NUCLÉAIRES

III. Findings

III. Regulatory Framework for Decommissioning
Findings

Canada lacks an adequate framework for decommissioning.

- Governing documents lack cohesion and do not provide sufficient detail
- At a minimum, IAEA guidance should be met
    - Entombment (i.e. in-situ decommissioning) is not an acceptable strategy
    - Establishment of a national waste management policy

III. Regulatory Framework for Decommissioning
Findings

Recommendation:

The Government of Canada should develop a principled overall policy framework underpinning a robust, clear, and enforceable regulatory regime for the decommissioning of nuclear facilities as well as the waste that arises from nuclear and decommissioning activities

III. Regulatory Framework for Decommissioning
Findings

Example 1 - University of Toronto (2000)

- Beryllium reflector was more radioactive than initially anticipated
- Excess radiation fields in nearby building
- Container in excess of the prescribed transport index
- No alternative transport arrangements in the detailed decommissioning plan (DDP)
- Lead shielding not available on site during incident as per the contingency plan in the DDP
- Intervenor concerned about lack of public consultation and communication

III. Past Decommissioning of SLOWPOKE-2 Reactors
Findings

Example 2 - Lessons Learned (U of T)

- CNSC should review the feasibility of the licensee's contingency plan and its efficacy.
- Because of the potential for human error, the CNSC must ensure sufficient precautions to protect the health and safety of workers and the public, including worst-case exposure scenarios and ongoing consultation with all relevant stakeholders.
- CNSC staff should produce lessons-learned reports for the benefit of future decommissioning projects and make these reports publicly available.

III. Past Decommissioning of SLOWPOKE-2 Reactors
Findings

***Example 3* - University of Dalhousie (2011)**

- Reactor control rod inadvertently extracted core during removal of reactor beryllium reflectors
- Cause of the event was related to surface tension
- Resulted in increased radiation dose to four decommissioning personnel

III. Past Decommissioning of SLOWPOKE-2 Reactors
Findings

***Example 3* - Lessons Learned (U of Dalhousie)**

- The CNSC must ensure the reliability and effectiveness of all systems, equipment and components affecting the safety of the SLOWPOKE reactor
- Lessons learned reports should be made publicly available and reviewed by the Commission for relevancy in subsequent licencing applications

III. Past Decommissioning of SLOWPOKE-2 Reactors
Findings

Recommendations:

- While the decommissioning of research reactors is often described in terms of its relative simplicity, the risk of unplanned events must be taken seriously and planned for as they have the potential to adversely impact the environment and human health and safety.
- The precautionary principle requires that the planning and execution of decommissioning activities prioritizes environmental protection, and human health and safety.

III. Adequacy of CNSC Staff and SRC's CMD

Findings

1. Environmental Assessment and Protection

- Unlike U of T and U of D, decommissioning of SRC's SLOWPOKE-2 reactor is not subject to federal environmental assessment under CEAA 2012 or IAA
- EA conducted under the *NSCA* is not an adequate nor equal substitute for EA under CEAA or IAA
  - NSCA review primarily relies on licensee information, not studies from independent experts of site, local and regional impacts

Recommendation: Decommissioning should be subject to federal IA law

III. Adequacy of CNSC Staff and SRC's CMD

Findings

2. Limited Scope of CNSC Staff Review

- CNSC staff CMD only reviews certain "relevant" Safety Control Areas: Human Performance Management, Radiation Protection, Environmental Protection, and Waste Management

Recommendation: The CNSC staff's CMD should include greater detail and provide a comprehensive review and assessment of a proponent's licencing application and supporting documentation.

III. Adequacy of CNSC Staff and SRC's CMD

Findings

3. Licence Conditions Handbook

- No draft LCH for the proposed decommissioning licence
- CNSC currently consulting on draft REGDOC-2.11.2, *Decommissioning*

Recommendation : The CNSC should require a draft LCH specific to decommissioning as part of SRC's licencing application and ensure that it reflects the CNSC's most up-to-date guidance documents.

III. Adequacy of CNSC Staff and SRC's CMD

Findings

4. Financial Guarantee

- Financial guarantee is unclear
  - Estimated cost: $6,665,826.00 (Detailed Decommissioning Plan)
  - Board of Directors authorized contracts up to $7.5M (Detailed Decommissioning Plan)
  - Financial guarantee of $5.76 and Board of Directors authorized contracts up to $7.5M (CNSC Staff CMD)

Recommendation: SRC's financial guarantee must be sufficient cover the estimated cost of decommissioning

III. Adequacy of CNSC Staff and SRC's CMD

Findings

5. Decommissioning Strategy

- SRC's proposed decommissioning strategy more akin to "entombment" than "prompt dismantling"
- Failure to take full inventory of radioisotopes present in pool structure
- Abandonment of University of Alberta SLOWPOKE despite presence of radionuclide concentrations above clearance levels
- Extent to which pool floor will be removed is unclear

5. Decommissioning Strategy (cont.)

Recommendation: The CNSC should require that the decommissioning of SRC's SLOWPOKE-2 reactor involve the total dismantlement and clean-up of the reactor pool structure.

III. Adequacy of CNSC Staff and SRC's CMD

Findings

6. Solid Waste

Recommendation: Radioactive waste generated from decommissioning should not be subject to clearance levels and approved for general release or recycling.

- Presence of hard to measure radioisotopes
- Potential for cumulative or additive risk
- Potential for leachate of radioactive material into the South Saskatchewan River from Saskatoon Landfill
  - No study undertaken by CNSC or licensee

III. Adequacy of CNSC Staff and SRC's CMD

Findings

7. Liquid Waste

- Sewage Use Bylaw No. 9466 does not establish any independent release criteria for radioactive waste and instead defers to the standards set by the CNSC
- Even with treatment, potential for cumulative or additive effects
  - No study undertaken by CNSC or licensee

Recommendation: The CNSC should not permit the release of approximately 28,380 liters of treated radioactive water into the public sewer system without a careful assessment of the cumulative or additive effects of the release.

III. Adequacy of CNSC Staff and SRC's CMD

Findings

8. On-Going Monitoring Post-Abandonment

- No requirement for on-going monitoring post-abandonment of SLOWPOKE reactors in Canada
- Concern because reactor waste contains large amounts of long-lived fusion products.

Recommendation: The CNSC should require on-going monitoring post-decommissioning and abandonment of SLOWPOKE research reactors.

IV. CONCLUSION

Until the deficiencies outlined in our report have been remedied, particularly with respect to the management of waste and the proposed decommissioning strategy, NWW and ICUCEC respectfully request the Canadian Nuclear Safety Commission not approve the decommissioning of SRC's SLOWPOKE-2 reactor as proposed.

Thank you.

NUCLEAR WASTE WATCH ACTION DÉCHETS NUCLÉAIRES

Summary of Recommendations

RECOMMENDATION NO. 1: In order to facilitate public participation, all Commission Member Documents (CMDs) and accompanying references should be made available on the CNSC's website at least 60 days in advance of intervention deadlines and remain on the website for future public use.

RECOMMENDATION NO. 2: Based on our review of applicable requirements governing decommissioning in Canada, we request that the CNSC:

1. Develop a principled overall policy framework underpinning a robust, clear, and enforceable regulatory regime for the decommissioning of nuclear facilities as well as the waste that arises from nuclear and decommissioning activities;
2. Stipulate the required evidentiary basis for a licensee's preferred decommissioning strategy and provide rationally based, clear, and enforceable conditions for its implementation.
3. Include enforceable conditions and detailed requirements for compliance within the approval for decommissioning activities.
4. Utilize the international best practices and standards as a guide to assess decommissioning planning and develop a comprehensive decommissioning policy and regulatory framework

NUCLEAR WASTE WATCH ACTION DÉCHETS NUCLÉAIRES

Summary of Recommendations (cont.)

RECOMMENDATION NO. 3: The CNSC should utilize the best practices of IAEA standards as a guide to assess decommissioning planning and develop a comprehensive decommissioning policy and regulatory framework.

RECOMMENDATION NO. 4: The CNSC should cease reliance on CSA standards for any matters relevant to nuclear licensing, and instead conduct all standard setting and guidance within the CNSC's processes.

RECOMMENDATION NO. 5: The CNSC should develop publicly acceptable policies and strategies for managing radioactive wastes and the decommissioning of nuclear facilities that reflect international best practices and have been developed in consultation with Indigenous peoples and the Canadian public. This should include, as a prerequisite, the development of a national classification scheme for radioactive waste, decommissioning strategies, and decommissioning execution that are scientifically sound and publicly acceptable.

Summary of Recommendations (cont.)

RECOMMENDATION NO. 6: The CNSC should clarify the scenarios in which in situ confinement will be considered an appropriate decommissioning strategy. Current international standards indicate that, short of an emergency scenario, this strategy should be limited to nuclear facilities that only contain short-lived or limited concentrations of long-lived radionuclides. The CNSC should provide clear definitions for what constitutes an "emergency scenario", "short-lived radionuclides", "limited concentrations" and "long-lived radionuclides" or any other criterion used to determine the viability of in situ confinement as a decommissioning strategy for nuclear facilities.

RECOMMENDATION NO. 7: The CNSC should require that a detailed decommissioning plan is submitted for approval within two to five years of permanent shutdown.

Summary of Recommendations (cont.)

RECOMMENDATION NO. 8: Approval for termination of decommissioning activities should not be granted unless:

1. The CNSC verifies that the licensee has demonstrated that the end state criteria as specified in the final decommissioning plan and any additional regulatory requirements have been met;
2. The end state criteria reflect the best available science and highest level of safety feasible for Canadians and the environment;
3. The public has been consulted before authorization for decommissioning is terminated, and the site of the nuclear facility is released from regulatory control.

RECOMMENDATION NO. 9: In the context of this licensing hearing, CNSC should review the feasibility of the licensee's contingency plan and its efficacy.

Summary of Recommendations (cont.)

RECOMMENDATION NO. 10: In light of the potential for human error, CNSC must ensure the licensee's application includes sufficient precautions to protect the health and safety of workers and the public, including worst-case exposure scenarios and ongoing consultation with all relevant stakeholders.

RECOMMENDATION NO. 11: Should there be an apparent lack of public involvement or interest in a licensing matter, the CNSC should inquire with the licensee, the extent to which they have been proactive in advancing public engagement and information sharing.

RECOMMENDATION NO. 12: CNSC staff should produce lessons-learned reports for the benefit of future decommissioning projects and make these reports publicly available.

RECOMMENDATION NO. 13: In light of the lessons learned by U of T and the IAEA, we request the Commission to review each in turn, and consider their relevancy to this application to decommission the SRC's SLOWPOKE-2 reactor.

Summary of Recommendations (cont.)

RECOMMENDATION NO. 14: In the context of this licensing hearing, we request that the CNSC ensure the reliability and effectiveness of all systems, equipment and components affecting the safety of the reactor.

RECOMMENDATION NO. 15: The CNSC should apply the precautionary principle in the context of decommissioning by prioritizing environmental protection, and human health and safety.

RECOMMENDATION NO. 16: The CNSC should prepare and make publicly available comprehensive lessons learned reports following each decommissioning project, and incorporate those lessons when reviewing future decommissioning licence applications.

RECOMMENDATION NO. 17: The CNSC staff's CMD should include greater detail and provide a comprehensive review and assessment of a proponent's licencing application and supporting documentation.

NUCLEAR WASTE WATCH ACTION DÉCHETS NUCLÉAIRES

Summary of Recommendations (cont.)

RECOMMENDATION NO. 18: The CNSC should require a draft LCH specific to decommissioning as part of SRC's licencing application and ensure that it reflects the CNSC's most up-to-date guidance documents.

RECOMMENDATION NO. 19: The SRC's decommissioning licence should not be granted by the CNSC unless SRC's financial guarantee is sufficient to cover the total estimated cost of proposed decommissioning work.

RECOMMENDATION NO. 20: The CNSC should require that the decommissioning of SRC's SLOWPOKE-2 reactor involve the total dismantlement and clean-up of the reactor pool structure.

RECOMMENDATION NO. 21: The CNSC should perform an independent analysis of core samples from the reactor pool as part of its inspection.

NUCLEAR WASTE WATCH ACTION DÉCHETS NUCLÉAIRES

Summary of Recommendations (cont.)

RECOMMENDATION NO. 22: None of the radioactively contaminated waste generated from the decommissioning of SRC's SLOWPOKE-2 reactor should be subject to clearance levels and approved for general release or recycling. Rather, such waste must be retained under regulatory control in appropriate radioactive waste management facilities.

RECOMMENDATION NO. 23: The CNSC should not permit the release of approximately 28,380 liters of treated radioactive water into the public sewer system without a careful assessment of the cumulative or additive effects of the release.

RECOMMENDATION NO. 24: The CNSC should require on-going monitoring post-decommissioning and abandonment of a nuclear facility.